

This report describes the results of the 2000-2001 Monitoring Program that was conducted in compliance with the Program's NPDES Municipal Stormwater Permit No. CAS614004. Elements of the Monitoring Program consisted of land use station monitoring, mass emission station monitoring, and the Critical Source/BMP Monitoring Study. The following are the principal conclusions and recommendations from this work.

5.1 OBJECTIVES ACHIEVED IN 2000-2001

The land use monitoring was conducted at seven stations and included flow composite sample data collected during 71 station events through April 7, 2001. The mass emission monitoring was conducted at 5 stations and consisted of 37 station events. Some grab sample data were also obtained at the mass emission stations. Generally, sampling activities were conducted according to plan, and attempts were made to capture as many storms as possible.

Monitoring at the land use stations and mass emission stations included a broad constituent suite including bacteria, metals, organics, major ions, and nutrients. The laboratory analytical efforts achieved detection limits (DL) as required by the Permit for all constituents, and achieved DLs that were lower than Permit requirements for many analytes, particularly for constituents of concern. Lower DLs are beneficial for two reasons: 1) to increase the probability of detection of potentially harmful substances at the concentrations of concern, and 2) to enhance the information value of the data by improving the quality of the data sets and allowing for more rigorous statistical analyses and data interpretation techniques. Thus, the major objective of runoff characterization at mass emission and land use catchments was achieved.

5.2 MASS EMISSION PROGRAM CONCLUSIONS

- Malibu Creek had noticeably higher median concentrations of both total and dissolved phosphorus, while the San Gabriel River has the highest median concentration of nitrate.
- The median total dissolved solids concentration in Malibu Creek is more than twice that of any other mass emission sites.
- Both total and fecal coliforms exhibited higher medians in the Los Angeles River. Ballona Creek had the greatest range of results for both total and fecal coliforms as well as fecal enterococcus. While the Los Angeles River had the greatest variability for fecal streptococcus results
- Concentrations were similar among stations for a given metal. In other words, no station appeared to be "cleaner" or "dirtier" than any other with respect to metals.
- There were several individual exceedances of water quality objectives, either of the California Toxics Rule or of the Ocean Plan (or of both), for metals; and in fact, total aluminum, total copper, dissolved copper, and total zinc each had at least one seasonal mean or median exceed an objective.

5.3 LAND USE PROGRAM CONCLUSIONS

- Runoff from the vacant catchment had high pH (8.0) and high alkalinity (median of 180 mg/l), while runoff from the light industrial, transportation, mixed residential, and high

density residential stations had lower median pH values (6.9, 6.8, 6.8, and 6.8 respectively) and lower median alkalinity concentrations (26, 21, 26, and 23 mg/l respectively). The educational and multiple family residential stations fell in between these two extremes with median pH values of 7.1 and 7.3 respectively, and median alkalinities of 31 and 48 mg/l respectively.

- Median hardness concentrations are similar to the alkalinity pattern: high (200 mg/l) at the vacant station; low in the transportation (30 mg/l), mixed residential (40 mg/l), and high density residential stations (20 mg/l); and in between (55, 60, and 75 mg/l) at the educational, light industrial, and multiple family residential stations.
- TSS results overlapped substantially among the different land uses; however, the light industrial station had the highest median for TSS (199 mg/l) being more than twice as high as the next highest median (84 mg/l for transportation).
- Total and dissolved copper concentrations overlapped among the different land uses, however, the dissolved copper median for the transportation station (31.6 µg/l) was more than twice as high as the next highest median (9.0 µg/l for mixed residential). Dissolved copper generally exceeds the 3.1 µg/l California Toxics Rule guideline while both mean and median concentrations of total copper exceed the Ocean Plan guideline in the transportation, light industrial, educational high density single family residential, and mixed residential stations.
- Total lead results are fairly consistent among land uses.
- Dissolved and total zinc exhibit similar patterns; there is substantial overlap among the different land uses although the mean and median for the light industrial station is highest in each case.

5.4 CRITICAL SOURCE PROGRAM CONCLUSIONS

A comparison of control to test sites for the motor freight companies reveals the following.

- Median oil and grease concentrations were higher at the test sites (5.50 mg/l) than the control sites (1.80 mg/l).
- Median bacterial counts for all bacterial types examined were lower at the test sites than the control sites.

A comparison of control to test sites for the auto dealers reveals the following.

- Median oil and grease concentrations were lower at the test sites (1.45 mg/l) than the control sites (3.7 mg/l).
- Median bacterial counts for all bacterial types examined were higher at the test sites than the control sites.

5.5 RECOMMENDATIONS

The Permit allows the discontinuation of monitoring at a land use station for specific constituents once the event mean concentration (EMC) is derived at the 25% error rate. We used the mean

standard error as a substitute for error rate as mutually agreed upon with the RWQCB (Swamikannu, 1999).

Of 114 station-constituents under investigation, 25 of them had an EMC with a mean standard error higher than 25%. In other words, there were 25 station-constituents which had a standard error (standard deviation of the mean) larger than 25% of their corresponding mean concentrations. These station-constituents must continue to be monitored under the current Permit. The remaining 89 station-constituent combinations met the criterion and it is recommended that monitoring be discontinued for these constituents at the associated stations.